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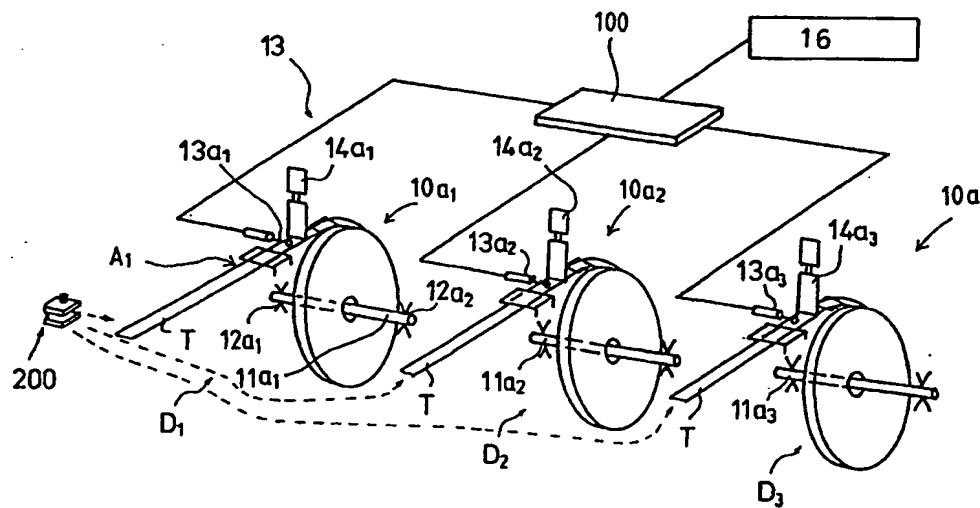
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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : D21G 3/00, B65H 49/00	A1	(11) International Publication Number: WO 99/45197 (43) International Publication Date: 10 September 1999 (10.09.99)
(21) International Application Number: PCT/FI99/00159 (22) International Filing Date: 2 March 1999 (02.03.99) (30) Priority Data: 980514 6 March 1998 (06.03.98) FI (71) Applicant: VALMET CORPORATION [FI/FI]; Panuntie 6, FIN-00620 Helsinki (FI). (72) Inventors: TOIVANEN, Heikki; Pitkäläntie 10, FIN-40950 Muurame (FI). ESKELINEN, Ilkka; Kipparinpolku 9, FIN-78300 Varkaus (FI). (74) Agent: FORSSÉN & SALOMAA OY; Yrjönkatu 30, FIN-00100 Helsinki (FI).		(81) Designated States: AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
(54) Title: EQUIPMENT AND METHOD IN HANDLING OF DOCTOR BLADES FOR A ROLL IN A PAPER/BOARD MACHINE  (57) Abstract <p>The invention concerns an equipment and a method in handling of doctor blades for a paper/board machine. The doctor blade (T) will be placed against the face of a roll in the paper/board machine so as to keep said face clean and to service said face. A doctor blade blank (T) is taken from a doctor blade roll (10a1, 10a2, 10a3 ...), i.e. from a reel. The equipment comprises a cut-off device (14a1, 14a2 ...) for cutting off the doctor blade material to the desired pull-out or blade length.</p>		

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Equipment and method in handling of doctor blades
for a roll in a paper/board machine

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The invention concerns an equipment and a method in handling of doctor blades for a roll in a paper/board machine.

- 10 From the prior art, the use of various doctor blades is known. A doctor blade is an important part which secures the operation of a paper/board machine, which blade, fitted in connection with a roll, maintains the condition of the roll face and permits the passing of a web portion that is to be passed into the pulper out of connection with the roll. As is well known, doctor blades have been stored in connection with
- 15 the paper/board machine on various shelves for doctor blades, from which shelves the doctor blade has been lifted straight into the doctor blade holder construction.

In the present patent application, a solution of an entirely novel type will be suggested for storage and preparation of doctor blades for a paper/board machine.

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- In accordance with the invention, a separate storage carriage is employed, which comprises at least one roll of doctor blades from which the doctor blade can be unwound. In accordance with the invention, the doctor blade material placed on the roll can be unwound through a separate measurement device and through a cut-off
- 25 device. The cut-off device comprises a measurement device in its connection, from which measurement device the pulled-out length of the doctor blade and the residual length remaining in the roll can be read. At the desired point, the feed of the doctor blade from the roll is stopped, and the doctor blade is cut off to the desired length. The roll of doctor blades has been fitted around a shaft, which has been mounted
- 30 revolving, and the band of doctor blades is passed through separate guides to the cut-off device, and a measurement detector of the measurement device is placed in direct vicinity of the cut-off device, which measurement detector measures the blade length

that has been fed. From a display placed in connection with a central unit, it is possible to read the blade length that has been fed out, and further, from the display it is possible to read the blade length that remains on the roll of doctor blades.

5 The roll of doctor blades is placed in a separate carriage, which can be shifted into different locations in connection with the paper/board machine. Thus, the same carriage can be used in different locations while the carriage comprises a number of different rolls of doctor blades and separate cut-off means and measurement detectors for said rolls of doctor blades.

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The method and the equipment in accordance with the invention are characterized in what is stated in the patent claims.

15 The invention will be described in the following with reference to some preferred embodiments of the invention illustrated in the figures in the accompanying drawings, the invention being, yet, not supposed to be confined to said embodiments alone.

20 Figure 1 is an axonometric view of a storage carriage for rolls of doctor blades, which carriage comprises, in accordance with the invention, separate positions for different reels of doctor blades or rolls of doctor blades as well as, for each roll, separate cut-off devices and measurement detectors for the device for measurement of the length of the doctor blade. The cut-off doctor blade blank is provided with perforations and fastenings and is, after that, installed in connection with a roll in
25 the paper/board machine.

Figure 2 is a schematic illustration of a roll of doctor blades, i.e. a reel of doctor blades $10a_1, 10a_2, 10a_3$, in accordance with the invention, wherein the blank of a doctor blade has been mounted on a shaft, which is provided with bearings, and
30 wherein, in the vicinity of the feed-out end of the doctor blade, there is a detector of the measurement device and a cut-off device. Further, in the vicinity of the feed-out opening, there is a guide for the doctor blade. A doctor blade placed on the roll

can also be called a doctor blade blank, because a doctor blade blank that has been cut off to the specified measure is provided with perforations and required fastenings.

- 5 Figure 3 is a schematic illustration of the operation of an equipment in accordance with the invention as a block diagram presentation.

Fig. 1 is an axonometric illustration of a storage carriage 50 for rolls of doctor blades 10a₁, 10a₂, 10a₃, which carriage comprises a frame R and an upper openable
10 lid R₁ and a side cover R₂. The rolls of doctor blades 10a₁, 10a₂ and 10a₃ are placed in compartments D₁, D₂ and D₃ inside the frame R. Each roll or reel of doctor blades 10a₁, 10a₂, 10a₃ has been mounted revolving on its shaft 11 by means of bearings 12a₁, 12a₂. For example, in connection with the feed-out opening A₁ of the compartment D₁ of the doctor blade roll 10a₁, there is the measurement detector
15 13a₁ of the device 13 for measurement of the length of the doctor blade T as well as the cut-off device 14a₁ and at least one guide 15a₁, 15a₁'.... Based on the measurement signal produced by means of the measurement detector 13a₁, the feed-out length of the doctor blade T that has been fed out and also the residual length remaining on the roll 10a₁ are computed in the central unit 100, and said measurement
20 data can be read from the display 16. When the desired/estimated feed-out length of the doctor blade T has been reached, the cut-off device 14 is operated and the doctor blade T is cut off. In a corresponding way, the similar stations D₂ and D₃ comprise similar arrangements of equipment for the doctor blade rolls 10a₂, 10a₃ connected with the stations. The feed-out length can also be estimated, in which case
25 no measurement device is used.

Fig. 2 is a schematic illustration of an equipment in accordance with the invention, which equipment comprises doctor blade roll stations D₁, D₂, D₃, of which stations each station D₁, D₂, D₃ is provided with a shaft 11a₁, 11a₂, 11a₃ of its own for a roll
30 of doctor blades 10a₁, 10a₂, 10a₃, bearings 12a₁, 12a₂ mounted on the shaft 11a₁, 11a₂, 11a₃, and further a feed-out opening A₁, A₂, A₃ and in its connection measurement detectors 13a₁, 13a₂, 13a₃ for the measurement equipment 13, as well as a

display 16 for the display of the measurement information produced from each station D_1, D_2, D_3 . The central unit 100 operates as a collector/processor of the data and feeds out the measurement data along the bus e_4 to the display 16, which measurement data have been obtained based on the information produced by the measurement detectors $13a_1, 13a_2, 13a_3$. The cut-off device $14a_1, 14a_2$ and $14a_3$ of each station D_1, D_2, D_3 can carry out the cutting-off of the doctor blade T based on the data read from the display 16. The cutting-off can be carried out by the operator of the carriage 50. In addition to the cut-off device, the equipment in accordance with the invention can also include a perforation device 200, by whose means pull-out holes can be perforated to the end/ends of the doctor blade. The perforation device can be fitted in connection with the cut-off device, or it can be a separate device which is independent from the cut-off device and which can be displaced to the desired position D_1, D_2, D_3 .

Further, the central unit 100 can include controls for the operation of the cut-off device $14a_1, 14a_2, 14a_3$, for example in connection with the lid R_1 of the carriage 50. Similarly, the display 16 can be placed in connection with the lid R_1 .

Fig. 3 is a block diagram presentation of the operation of the device in accordance with the invention. From the measurement detectors $13a_1, 13a_2$ or $13a_3$ of the stations D_1, D_2, D_3 the measurement information n is passed along the data transfer buses e_1, e_2, e_3 to the central unit 100, and further from the central unit 100 there is a data transfer bus e_4 to the display 16 for reading of the information of the station D_1 and/or D_2 and/or D_3 . Optionally it is possible to read the length of the blade T that has been pulled out of the opening A_1 or A_2 or A_3 , in which case the cut-off device $14a_1$ and/or $14a_2$ and/or $14a_3$ can be operated when the desired pull-out length has been reached. From the display 16 it is also possible to read, in respect of each station D_1 or D_2 or D_3 , the remaining blade length of the doctor blade roll $10a_1$ or $10a_2$ or $10a_3$ placed in the respective station. The guide $15a_1, 15a_1', \dots; 15a_2, 15a_2', \dots; 15a_3, 15a_3', \dots$ controls the blade T in a controlled way past the measurement detector $13a_1, 13a_2, 13a_3$ of each station D_1, D_2, D_3 and further past the cut-off device $14a_1, 14a_2, 14a_3$ related to the station D_1, D_2, D_3, \dots

Claims

1. An equipment in handling of doctor blades for a paper/board machine, which doctor blade (T) will be placed against the face of a roll in the paper/board machine so as to keep said face clean and to service said face, characterized in that a doctor blade blank (T) is taken from a doctor blade roll (10a₁,10a₂,10a₃...), i.e. from a reel, and that the equipment comprises a cut-off device (14a₁,14a₂...) for cutting off the doctor blade material to the desired pull-out or blade length.
2. An equipment as claimed in claim 1, characterized in that the equipment comprises a measurement device (13), and the pull-out length can be read on the basis of the information transferred by the measurement detector (13a₁,13a₂,13a₃...) of said measurement device (13) to the central unit (100) in order to cut-off the desired length of a doctor blade.
3. An equipment as claimed in any of the preceding claims, characterized in that the equipment comprises a display (16) in connection with the central unit (100), from which display it is possible to read the length pulled out from a doctor blade roll (10a₁,10a₂,10a₃...), based on the information transmitted by a measurement detector (13a₁,13a₂,13a₃...) of the measurement device (13), so as to determine the correct cut-off point.
4. An equipment as claimed in any of the preceding claims, characterized in that the measurement detector (13a₁,13a₂...) and the cut-off device (14a₁,14a₂...) are placed in the vicinity of the blade (T) feed-out opening (A₁,A₂...) of the doctor blade roll station (D₁,D₂,D₃...), and that the doctor blade blank (T) can be controlled by means of a guide (15a₁,15a₁';15a₂,15a₂'...) in a controlled way out of the doctor blade roll station (D₁,D₂,D₃...).
5. An equipment as claimed in any of the preceding claims, characterized in that the doctor blade rolls (10a₁,10a₂,10a₃...) have been fitted on shafts (11a₁,11a₂,11a₃) of their own, which have been mounted by means of bearings (12a₁,12a₂...).

6. An equipment as claimed in any of the preceding claims, characterized in that the central unit (100) is connected with a data transfer bus (e_1, e_2, e_3) passing from the measurement detector ($13a_1, 13a_2, 13a_3$) of the measurement device (13), and that there is a data transfer bus (e_4) from the central unit (100) to the display (16).

5

7. An equipment as claimed in any of the preceding claims, characterized in that the doctor blade rolls ($10a_1, 10a_2, 10a_3$) in each doctor blade roll station (D_1, D_2, D_3) are placed in a storage carriage (50), which storage carriage (50) comprises wheels ($50a_1, 50a_2, 50a_3, 50a_4$) for moving the storage carriage (50), in which case the storage carriage can be shifted readily to the desired location in connection with the paper/board machine.

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8. An equipment as claimed in claim 1, characterized in that the equipment further comprises a perforation device (200) for perforation of pull-out holes to the end/ends of the doctor blade.

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9. A method in handling of doctor blades for a paper/board machine, which doctor blades are meant to be used in connection with rolls of a paper/board machine for servicing of their roll faces, characterized in that, in the method, a doctor blade blank is guided from a doctor blade roll ($10a_1, 10a_2, 10a_3...$) to a cut-off device ($14a_1, 14a_2, 14a_3$), and that there is a measurement device (13) and therein a measurement detector ($13a_1, 13a_2, 13a_3$), and the length of the doctor blade pulled out from the doctor blade roll can be read based on the information transmitted by said detector in order to determine the correct cut-off point of the doctor blade (T), and that by means of the cut-off device ($14a_1, 14a_2, 14a_3$) the doctor blade (T) that has been pulled out is cut off to the desired cut-off length.

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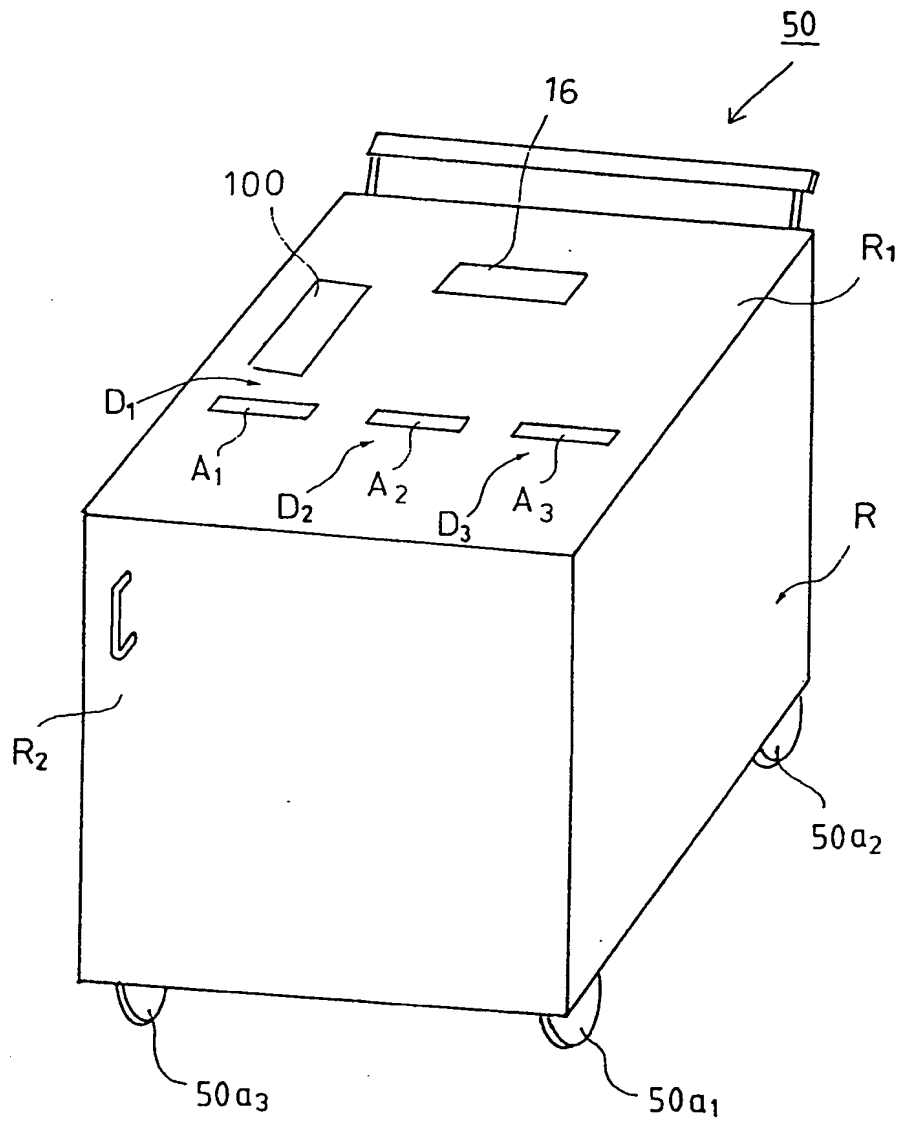


FIG. 1

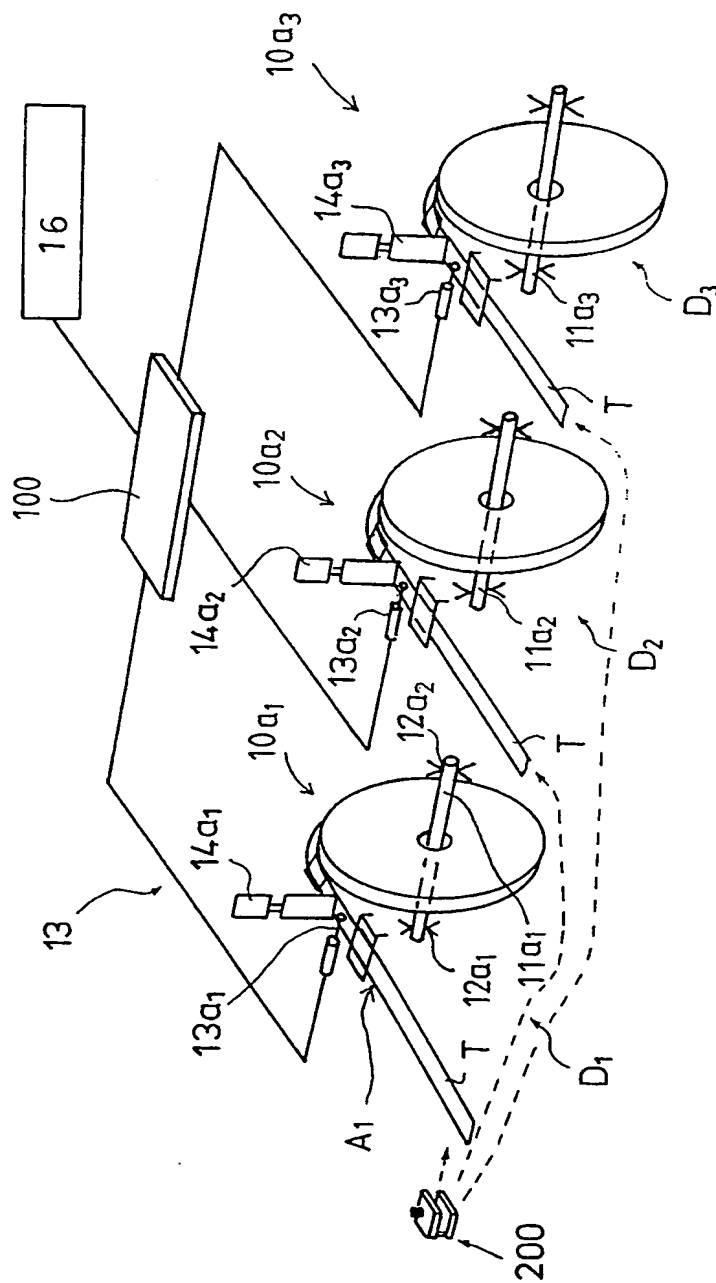


FIG. 2

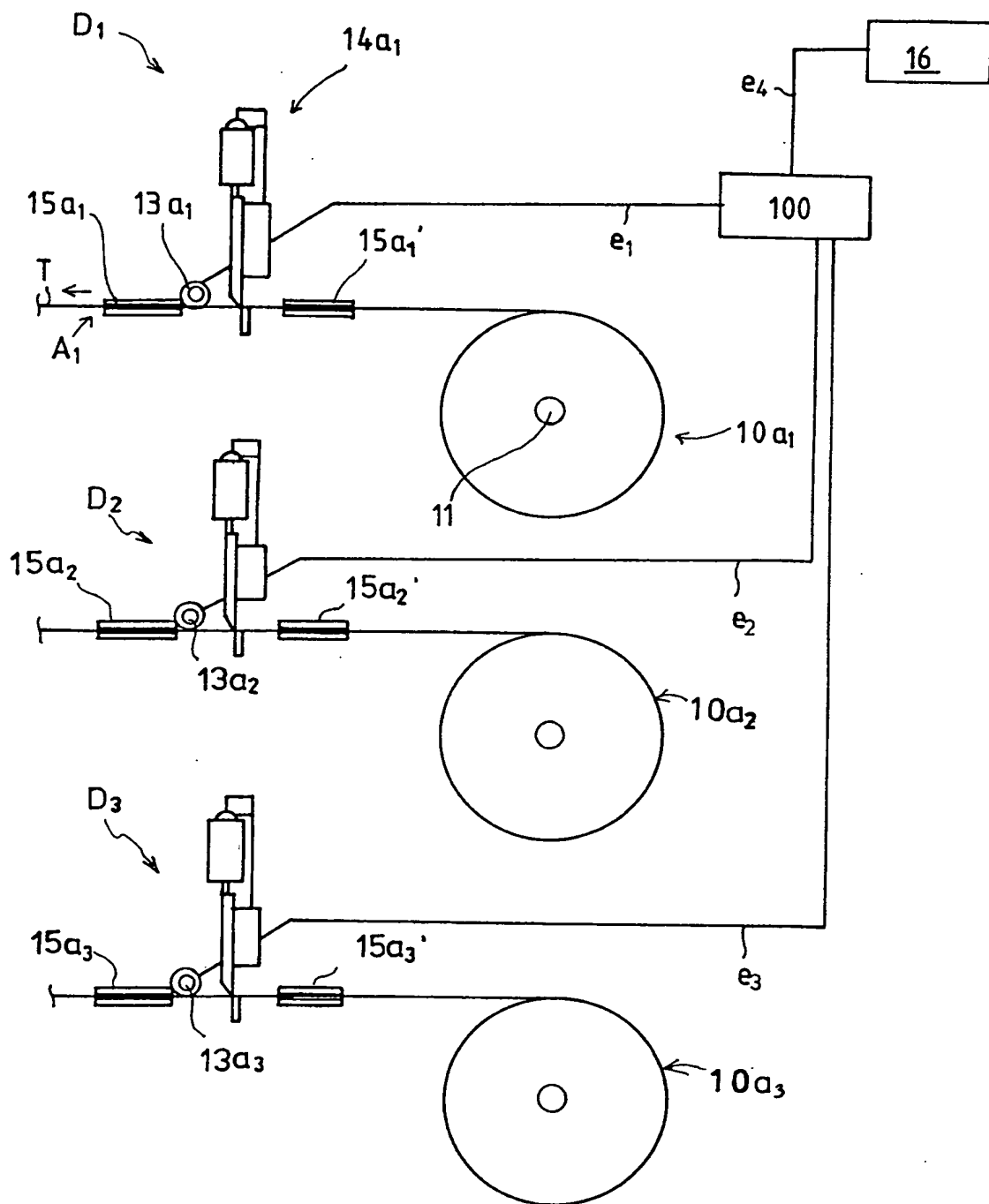


FIG. 3

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 99/00159

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: D21G 3/00, B65H 49/00

According to International Patent Classification (IPC) or to both national classification and IPC

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3810588 A (RALPH P. MAHONEY), 14 May 1974 (14.05.74) --	1-9
A	US 3318443 A (D.A.HILLIS), 9 May 1967 (09.05.67) --	1-9
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